

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. *(Currently amended)*

A method of bonding a metallic membrane with a metallic part comprising:
directly physically contacting a smooth surface of the a metallic membrane comprising palladium against a smooth surface of the metallic part without any intervening material being present between the two contacting surfaces and mechanically pressing the metallic membrane and the metallic part together;

heating the directly physically contacting metallic membrane comprising palladium and the metallic part to a temperature above the half melting point of the metallic membrane while subjecting the metallic membrane and metallic part to a controlled environment of a reducing gas atmosphere.

2. *(Original)*

The method of claim 1 wherein the mechanically pressing is in the range of 100 psig to 10,000 psig.

3. *(Original)*

The method of claim 1 wherein the pressure exerted by the mechanically pressing together of the metallic membrane and the metallic part is in the range of about 1,000 psig to about 3,000 psig.

4. *(Original)*

The method of claim 1 wherein the heating to a temperature above the half melting point is to a temperature between 450°C and 1100°C.

5. *(Cancelled)*

6. *(Original)*

The method of claim 1 wherein the metallic membrane is a palladium-based foil.

7. *(Original)*

The method of claim 1 wherein the metallic membrane is 75%/wt Pd-25%/wt Ag alloy.

8. *(Original)*

The method of claim 1 wherein the metallic membrane is Pd-Ru alloy.

9. *(Previously presented)*

The method of claim 1 wherein the mechanical pressing, the heating and the subjecting to a reducing gas atmosphere are carried out for at least 4 hours.

10. *(Previously presented)*

The method of claim 1 wherein the mechanical pressing, the heating and the subjecting to a reducing gas atmosphere are carried out for at least 5 hours.

11. *(Previously presented)*

The method of claim 1 wherein the mechanical pressing, the heating and the subjecting to a reducing gas atmosphere are carried out for about 24 hours.

12. *(Previously presented)*

The method of claim 1 wherein the mechanical pressing, the heating and the subjecting to a reducing gas atmosphere are carried out for about 30 hours.

13. *(Previously presented)*

The method of claim 1 wherein the metallic membrane is hydrogen permeable.

14. *(Previously presented)*

The method of claim 1 wherein the reducing gas comprises hydrogen.

15. *(Cancelled)*

16. *(Cancelled)*

17. *(Previously presented)*

The method of claim 1 further comprising:
polishing the surface of the metallic membrane; and
polishing the surface of the metallic part prior to the mechanical pressing.

18. *(Previously presented)*

The method of claim 14 wherein the hydrogen is at a pressure of 15 psig.